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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BURD, KEVIN MICHAEL	

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/750,064	MALTSEV ET AL.	
	Examiner	**Art Unit**	
	Kevin M. Burd	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _24 June 2009_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-6,10-16 and 18_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-6,10-16 and 18_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. This office action, in response to the request for continued examination (RCE) filed 6/24/2009 is a non-final office action.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/24/2009 has been entered.

Response to Arguments

3. The declaration filed on 6/24/2009 under 37 CFR 1.131 has been considered but is ineffective to overcome the Sun et al (US 2005/0152314) reference. The declaration is silent regarding where the prior invention was established. Prior invention may not be established under this section in any country other than the United States, a NAFTA country, or a WTO member country (MPEP 715).

For this reason and the reasons stated in the previous office action, the rejections of the claims are maintained and stated below.

4. Additional rejections of the claims are stated below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al (US 2005/0152314) in view of Andre (WO 01/37474) further in view of Ebiko et al (WO 03/071712). Ebiko et al (US 2004/0161058) is a translation of Ebiko et al (WO 03/071712) and is referenced in the rejection stated below.

Regarding claim 1, Sun discloses an averaging circuit adapted to provide an averaged channel estimate by performing a time domain averaging and a frequency domain averaging on one or more received inputs (paragraph 0154). An equalizer equalizes a received multicarrier symbol based on the averaged channel estimate. The channel estimate H is used to calculate the equalization (paragraphs 0155-0160). Sun does not disclose a coarse channel estimator to receive a symbol replica and a received symbol to generate a coarse channel estimate. However, it is well known in the art of data communication that a received signal is equivalent to the transmitted signal and the distortion caused by the medium the transmitted signal travels through prior to being received. This fact is shown in figure 3a of Andre. The response H of a channel is equal to the received sequence divided by the known transmitted sequence in the frequency domain. This is further described in page 9, lines 11-21. The transfer function is the channel estimate. It would have been obvious for one of ordinary skill in the art at the

time of the invention to combine the teachings of Andre into the apparatus of Sun to utilize the equation of H(f) = R(f)/T(f) to determine a transfer function (channel estimate). The channel estimate is important to determine in a receiver since the distortion cause by the channel will degrade the received signal and may prevent the proper recovery of the transmitted signal. The combination discloses a known sequence is used to determine the channel response. The known sequence will be stored in the receiver. The combination does not disclose the generation of a replica of the transmitted symbol. Ebiko discloses a received sequence is input to a channel estimation section 120 (figure 1). The channel estimation section receives a replica of the received signal from the equalizer 130 (abstract). The replica of the received signal is de-interleaved 140 and decoded 150 to recover the originally transmitted symbol. This symbol is fed to the channel estimation section 120 to determine the channel estimation. The channel estimation receives a received symbol and the replica of the originally transmitted symbol. It would have been obvious for one of ordinary skill in the art at the time of the invention to include an adaptive equalizer in the apparatus. Instead of using a fixed replica symbol and being required to transmit a known sequence to determine the channel estimate, data is used to calculate the estimate. Therefore, the data rate of the system is increased allowing more data to be transmitted in less time than before.

Regarding claim 2, Sun discloses the averaging circuit is adapted to provide an averaged channel estimate by performing time domain averaging and frequency domain averaging on one or more received channel estimates (paragraph 0154).

Regarding claim 3, Sun further discloses the averaging circuit comprises a time domain averaging block adapted to perform time domain averaging on a plurality of received channel estimates to generate a time domain averaged channel estimate on a per subcarrier basis (paragraphs 0154 and 0156). A frequency domain averaging block is adapted to perform frequency domain averaging on a received time domain averaged channel estimate (paragraph 0154). The time domain averaging is taken prior to the FFT and the frequency domain averaging is done after the FFT.

Regarding claim 10, Sun discloses the multicarrier symbol comprises an OFDM symbol (paragraph 0110).

Regarding claims 11 and 13, Sun discloses an averaging circuit adapted to provide an averaged channel estimate by performing a time domain averaging and a frequency domain averaging on one or more received inputs (paragraph 0154). An equalizer equalizes a received multicarrier symbol based on the averaged channel estimate. The channel estimate H is used to calculate the equalization (paragraphs 0155-0160). Sun discloses the equalizer comprises an adaptive equalizer (paragraph 0156). Sun does not disclose a coarse channel estimator to receive a symbol replica and a received symbol to generate a coarse channel estimate. However, it is well known in the art of data communication that a received signal is equivalent to the transmitted signal and the distortion caused by the medium the transmitted signal travels through prior to being received. This fact is shown in figure 3a of Andre. The response H of a channel is equal to the received sequence divided by the known transmitted sequence in the frequency domain. This is further described in page 9, lines

11-21. The transfer function is the channel estimate. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Andre into the apparatus of Sun to utilize the equation of H(f) = R(f)/T(f) to determine a transfer function (channel estimate). The channel estimate is important to determine in a receiver since the distortion cause by the channel will degrade the received signal and may prevent the proper recovery of the transmitted signal. Andre transmits a known sequence to determine the effect of the channel on the received data. The channel can be compensated for and data will be properly recovered. The combination does not disclose the generation of a replica of the transmitted symbol. Ebiko discloses a received sequence is input to a channel estimation section 120 (figure 1). The channel estimation section receives a replica of the received signal from the equalizer 130 (abstract). The replica of the received signal is de-interleaved 140 and decoded 150 to recover the originally transmitted symbol. This symbol is fed to the channel estimation section 120 to determine the channel estimation. The channel estimation receives a received symbol and the replica of the originally transmitted symbol. It would have been obvious for one of ordinary skill in the art at the time of the invention to include an adaptive equalizer in the apparatus. Instead of using a fixed replica symbol and being required to transmit a known sequence to determine the channel estimate, data is used to calculate the estimate. Therefore, the data rate of the system is increased allowing more data to be transmitted in less time than before.

Regarding claim 12, Sun discloses the averaging circuit is adapted to provide an averaged channel estimate by performing time domain averaging and frequency domain averaging on one or more received channel estimates (paragraph 0154).

Regarding claim 14, Sun discloses the multicarrier symbol comprises an OFDM symbol (paragraph 0110).

6. Claims 4, 15, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al (US 2005/0152314) in view of Andre (WO 01/37474) further in view of Ebiko et al (WO 03/071712) further in view of Kim et al (US 2004/0125235).

Regarding claim 4, the combination of Sun, Andre and Ebiko discloses the apparatus stated above in paragraph 5. The combination does not disclose the frequency domain averaging block generates frequency domain averaged channel estimates that are used to update coefficients of the equalizer. Kim discloses using channel estimates to update coefficients of the equalizer (paragraph 0021) to reduce channel distortion (paragraph 0021). For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the coefficient update of Kim into the apparatus of the combination of Sun, Andre and Ebiko.

Regarding claims 15 and 16, Sun discloses an averaging circuit adapted to provide an averaged channel estimate by performing a time domain averaging and a frequency domain averaging on one or more received inputs (paragraph 0154). An equalizer equalizes a received multicarrier symbol based on the averaged channel estimate. The channel estimate H is used to calculate the equalization (paragraphs

0155-0160). Sun does not disclose a coarse channel estimator to receive a symbol replica and a received symbol to generate a coarse channel estimate. However, it is well known in the art of data communication that a received signal is equivalent to the transmitted signal and the distortion caused by the medium the transmitted signal travels through prior to being received. This fact is shown in figure 3a of Andre. The response H of a channel is equal to the received sequence divided by the known transmitted sequence in the frequency domain. This is further described in page 9, lines 11-21. The transfer function is the channel estimate. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Andre into the apparatus of Sun to utilize the equation of $H(f) = R(f)/T(f)$ to determine a transfer function (channel estimate). The channel estimate is important to determine in a receiver since the distortion cause by the channel will degrade the received signal and may prevent the proper recovery of the transmitted signal. The combination discloses a known sequence is used to determine the channel response. The known sequence will be stored in the receiver. The combination does not disclose the generation of a replica of the transmitted symbol. Ebiko discloses a received sequence is input to a channel estimation section 120 (figure 1). The channel estimation section receives a replica of the received signal from the equalizer 130 (abstract). The replica of the received signal is de-interleaved 140 and decoded 150 to recover the originally transmitted symbol. This symbol is fed to the channel estimation section 120 to determine the channel estimation. The channel estimation received a received symbol and the replica of the originally transmitted symbol. It would have been obvious for one of ordinary skill in the

art at the time of the invention to include an adaptive equalizer in the apparatus. Instead of using a fixed replica symbol and being required to transmit a known sequence to determine the channel estimate, data is used to calculate the estimate. Therefore, the data rate of the system is increased allowing more data to be transmitted in less time than before. The combination of Sun, Andre and Ebiko does not disclose the frequency domain averaging block generates frequency domain averaged channel estimates that are used to update coefficients of the equalizer. Kim discloses using channel estimates to update coefficients of the equalizer (paragraph 0021) to reduce channel distortion (paragraph 0021). For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the coefficient update of Kim into the apparatus of the combination of Sun, Andre and Ebiko.

Regarding claim 18, Sun discloses an averaging circuit adapted to provide an averaged channel estimate by performing a time domain averaging and a frequency domain averaging on one or more received inputs (paragraph 0154). An equalizer equalizes a received multicarrier symbol based on the averaged channel estimate. The channel estimate H is used to calculate the equalization (paragraphs 0155-0160). Sun does not disclose a coarse channel estimator to receive a symbol replica and a received symbol to generate a coarse channel estimate. However, it is well known in the art of data communication that a received signal is equivalent to the transmitted signal and the distortion caused by the medium the transmitted signal travels through prior to being received. This fact is shown in figure 3a of Andre. The response H of a channel is equal to the received sequence divided by the known transmitted sequence in the frequency

domain. This is further described in page 9, lines 11-21. The transfer function is the channel estimate. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Andre into the apparatus of Sun to utilize the equation of $H(f) = R(f)/T(f)$ to determine a transfer function (channel estimate). The channel estimate is important to determine in a receiver since the distortion cause by the channel will degrade the received signal and may prevent the proper recovery of the transmitted signal. Andre transmits a known sequence to determine the effect of the channel on the received data. The channel can be compensated for and data will be properly recovered. The combination does not disclose the generation of a replica of the transmitted symbol. Ebiko discloses a received sequence is input to a channel estimation section 120 (figure 1). The channel estimation section receives a replica of the received signal from the equalizer 130 (abstract). The replica of the received signal is de-interleaved 140 and decoded 150 to recover the originally transmitted symbol. This symbol is fed to the channel estimation section 120 to determine the channel estimation. The channel estimation receives a received symbol and the replica of the originally transmitted symbol. It would have been obvious for one of ordinary skill in the art at the time of the invention to include an adaptive equalizer in the apparatus. Instead of using a fixed replica symbol and being required to transmit a known sequence to determine the channel estimate, data is used to calculate the estimate. Therefore, the data rate of the system is increased allowing more data to be transmitted in less time than before. The combination of Sun, Andre and Ebiko does not disclose the frequency domain averaging block generates frequency domain averaged channel estimates that

are used to update coefficients of the equalizer. Kim discloses using channel estimates to update coefficients of the equalizer (paragraph 0021) to reduce channel distortion (paragraph 0021). For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the coefficient update of Kim into the apparatus of the combination of Sun, Andre and Ebiko.

7. Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al (US 2005/0152314) in view of Andre (WO 01/37474) further in view of Ebiko et al (WO 03/071712) further in view of Papathanasion (US 2004/0142665).

Regarding claim 5, the combination of Sun, Andre and Ebiko discloses the apparatus stated above in paragraph 5. The combination does not disclose the time domain averaging is performed using a moving average. Papathanasion discloses averaging using a moving average in paragraph 0042. Moving averaging is well known in the art for its ability to maintain a constant average value. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teaching of Papathanasion into the apparatus of the combination of Sun, Andre and Ebiko.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al (US 2005/0152314) in view of Andre (WO 01/37474) further in view of Ebiko et al (WO 03/071712) further in view of Abeta et al (US 6,757,272).

Regarding claim 6, the combination of Sun, Andre and Ebiko discloses the apparatus stated above in paragraph 5. The combination does not disclose the time domain averaging is done by block averaging. Abeta discloses using block averaging (column 7, lines 57-67) since block averaging is computationally efficient since the average is not being constantly calculated. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the block averaging of Abeta into the combination of Sun, Andre and Ebiko.

9. Claims 1-4, 10-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mody et al (US 2002/0181390) in view of Ebiko et al (WO 03/071712). Ebiko et al (US 2004/0161058) is a translation of Ebiko et al (WO 03/071712) and is referenced in the rejection stated below.

Regarding claim 1, Mody discloses an averaging circuit adapted to provide an averaged channel estimate by performing a time domain averaging and a frequency domain averaging on one or more received inputs (claim 29). The aim of the channel estimation algorithm is to estimate the channel coefficients for all the sub-carriers (paragraph 0085). The averaging of the coarse channel estimates in the frequency domain and the time domain takes place in the parameter estimator 112 of figure 8. The parameter estimator 112 provides an input signal to channel decoder 118 that detects and corrects errors in the data symbols (paragraph 0076). The channel decoder 118 outputs the data in its original form (paragraph 0076). The channel decoder is the adaptive equalizer and will provided feedback signals to the parameter estimator to

adjust and correct its estimates according to the output of the channel decoder (paragraph 0076). The channel estimate is equal to the transfer function. The received signal is equivalent to the transmitted signal and the distortion caused by the medium the transmitted signal travels through prior to being received. The response H of a channel is equal to the received sequence divided by the known transmitted sequence in the frequency domain. The adjustments to the estimates will be conducted according to the equation of $H(f) = R(f)/T(f)$ to determine a transfer function (channel estimate). The combination discloses a known sequence is used to determine the channel response. The known sequence will be stored in the receiver. This is described as a training sequence in paragraph 0076. The combination does not disclose the generation of a replica of the transmitted symbol. Ebiko discloses a received sequence is input to a channel estimation section 120 (figure 1). The channel estimation section receives a replica of the received signal from the equalizer 130 (abstract). The replica of the received signal is de-interleaved 140 and decoded 150 to recover the originally transmitted symbol. This symbol is fed to the channel estimation section 120 to determine the channel estimation. The channel estimation receives a received symbol and the replica of the originally transmitted symbol. It would have been obvious for one of ordinary skill in the art at the time of the invention to include an adaptive equalizer in the apparatus. Instead of using a fixed replica symbol and being required to transmit a known sequence to determine the channel estimate, data is used to calculate the estimate. Therefore, the data rate of the system is increased allowing more data to be transmitted in less time than before.

Regarding claim 2, Mody discloses the averaging circuit is adapted to provide an averaged channel estimate by performing time domain averaging and frequency domain averaging on one or more received channel estimates (claim 29).

Regarding claim 3, Mody further discloses the averaging circuit comprises a time domain averaging block adapted to perform time domain averaging on a plurality of received channel estimates to generate a time domain averaged channel estimate on a per subcarrier basis (claim 29). Figures 9 and 10 disclose the estimates take place in the time domain and the frequency domain (paragraphs 0083 and 0085).

Regarding claim 4, Mody discloses the aim of the channel estimation algorithm is to estimate the channel coefficients for all the sub-carriers (paragraph 0085).

Regarding claim 10, Mody discloses the multicarrier symbol comprises an OFDM symbol (abstract).

Regarding claims 11 and 13, Mody discloses an averaging circuit adapted to provide an averaged channel estimate by performing a time domain averaging and a frequency domain averaging on one or more received inputs (claim 29). The aim of the channel estimation algorithm is to estimate the channel coefficients for all the sub-carriers (paragraph 0085). The averaging of the coarse channel estimates in the frequency domain and the time domain takes place in the parameter estimator 112 of figure 8. Fine channel estimates are conducted in the time and frequency domains (paragraph 0089). The parameter estimator 112 provides an input signal to channel decoder 118 that detects and corrects errors in the data symbols (paragraph 0076). The channel decoder 118 outputs the data in its original form (paragraph 0076). The channel

decoder is the adaptive equalizer and will provided feedback signals to the parameter estimator to adjust and correct its estimates according to the output of the channel decoder (paragraph 0076). The channel estimate is equal to the transfer function. The received signal is equivalent to the transmitted signal and the distortion caused by the medium the transmitted signal travels through prior to being received. The response H of a channel is equal to the received sequence divided by the known transmitted sequence in the frequency domain. The adjustments to the estimates will be conducted according to the equation of H(f) = R(f)/T(f) to determine a transfer function (channel estimate). The combination discloses a known sequence is used to determine the channel response. The known sequence will be stored in the receiver. This is described as a training sequence in paragraph 0076. The combination does not disclose the generation of a replica of the transmitted symbol. Ebiko discloses a received sequence is input to a channel estimation section 120 (figure 1). The channel estimation section receives a replica of the received signal from the equalizer 130 (abstract). The replica of the received signal is de-interleaved 140 and decoded 150 to recover the originally transmitted symbol. This symbol is fed to the channel estimation section 120 to determine the channel estimation. The channel estimation receives a received symbol and the replica of the originally transmitted symbol. It would have been obvious for one of ordinary skill in the art at the time of the invention to include an adaptive equalizer in the apparatus. Instead of using a fixed replica symbol and being required to transmit a known sequence to determine the channel estimate, data is used to calculate the

estimate. Therefore, the data rate of the system is increased allowing more data to be transmitted in less time than before.

Regarding claim 12, Mody discloses the averaging circuit is adapted to provide an averaged channel estimate by performing time domain averaging and frequency domain averaging on one or more received channel estimates (claim 29).

Regarding claim 14, Mody discloses the multicarrier symbol comprises an OFDM symbol (abstract).

Regarding claims 15, 16 and 18, Mody discloses a method of calculating averaged channel estimate by performing a time domain averaging and a frequency domain averaging on one or more received inputs (claim 29). The time domain channel estimates are then converted to frequency domain channel estimates by performing an FFT on the time domain channel estimates (paragraph 0089). The aim of the channel estimate algorithm is to estimate the channel coefficients for all the sub-carriers (paragraph 0085). The parameter estimator 112 provides an input signal to channel decoder 118 that detects and corrects errors in the data symbols (paragraph 0076). The channel decoder 118 outputs the data in its original form (paragraph 0076). The channel decoder is the adaptive equalizer and will provided feedback signals to the parameter estimator to adjust and correct its estimates according to the output of the channel decoder (paragraph 0076). The channel estimate is equal to the transfer function. The received signal is equivalent to the transmitted signal and the distortion caused by the medium the transmitted signal travels through prior to being received. The response H of a channel is equal to the received sequence divided by the known transmitted

sequence in the frequency domain. The adjustments to the estimates will be conducted according to the equation of H(f) = R(f)/T(f) to determine a transfer function (channel estimate). The combination discloses a known sequence is used to determine the channel response. The known sequence will be stored in the receiver. This is described as a training sequence in paragraph 0076. The combination does not disclose the generation of a replica of the transmitted symbol. Ebiko discloses a received sequence is input to a channel estimation section 120 (figure 1). The channel estimation section receives a replica of the received signal from the equalizer 130 (abstract). The replica of the received signal is de-interleaved 140 and decoded 150 to recover the originally transmitted symbol. This symbol is fed to the channel estimation section 120 to determine the channel estimation. The channel estimation receives a received symbol and the replica of the originally transmitted symbol. It would have been obvious for one of ordinary skill in the art at the time of the invention to include an adaptive equalizer in the apparatus. Instead of using a fixed replica symbol and being required to transmit a known sequence to determine the channel estimate, data is used to calculate the estimate. Therefore, the data rate of the system is increased allowing more data to be transmitted in less time than before.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mody et al (US 2002/0181390) in view of Ebiko et al (WO 03/071712) further in view of Papathanasion (US 2004/0142665).

Regarding claim 5, the combination of Mody and Ebiko discloses the apparatus stated above in paragraph 9. The combination does not disclose the time domain averaging is performed using a moving average. Papathanasion discloses averaging using a moving average in paragraph 0042. Moving averaging is well known in the art for its ability to maintain a constant average value. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teaching of Papathanasion into the apparatus of the combination of Mody and Ebiko.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mody et al (US 2002/0181390) in view of Ebiko et al (WO 03/071712) further in view of Abeta et al (US 6,757,272).

Regarding claim 6, the combination of Mody and Ebiko discloses the apparatus stated above in paragraph 9. The combination does not disclose the time domain averaging is done by block averaging. Abeta discloses using block averaging (column 7, lines 57-67) since block averaging is computationally efficient since the average is not being constantly calculated. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the block averaging of Abeta into the combination of Mody and Ebiko.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin M. Burd/
Primary Examiner, Art Unit 2611
6/30/2009